

Claims 37-68 are pending, and all claims stand rejected under 35 USC 103(a) over Powell et al., U.S. Patent No. 3,202,705 (“Powell”) in view of Walkup et al., U.S. Patent 5,252,473 (“Walkup”). Applicants respectfully traverse this rejection.

Independent claims 37 and 40 recite, in pertinent parts: (a) contacting an aqueous solution containing a water-soluble lactate salt with a protonated cation exchanger to “form an aqueous solution of lactic acid and a cation exchanger having cations bound thereto”; and (b) yielding a second product, “wherein said second product is a basic form of said cation of said lactate salt.”

Neither (a) nor (b) is met by Powell and Walkup, taken either alone or in combination.

Powell describes a process for producing lactic acid from fermentation liquor by steps including the addition of calcium carbonate (col. 1, lines 59-64), and acidulation using sulfuric acid to convert calcium lactate to lactic acid (col. 2, lines 8-15). The lactic acid is then passed through a cation exchanger to purify the lactic acid stream. The cation resin is used to remove color bodies such as amino acids and other byproducts of the fermentation process (col. 3, lines 1-12). Therefore, the exchanger is **not** contacted with a lactic acid salt, and cations from a lactate salt are **not** bound to the cation ion exchange resin.

In addition, the regeneration of the cation includes washing with water, alkali, water, mineral acid, and water (col. 3, line 23-col. 4, line 22). The alkali wash discharges negative

charges on the resin (not cations as claimed), and causes swelling of the particles to physically loosen the color bodies. Then, the mineral acid wash restores the resin to a charged hydrogen cycle. Thus, this process does **not** form a second product of a basic form of the cation of the lactate salt.

Walkup describes a process for producing fermentation liquor including ammonium lactate. The ammonium lactate is then converted to a lactic ester by mixing with an alcohol and an effective amount of carbon dioxide (col. 5, lines 9-18). Walkup also describes producing lactic acid by hydrolyzing a lactic acid ester using an acidic ion exchange resin catalyst with sufficient temperature and pressure (col. 14, lines 34-57). Used as a catalyst, there is no exchange resin during the hydrolysis process. Indeed, Walkup states that the benefits of using a cation resin bed include an acid catalyst that is fixed and immobile and thus processing would not require another purification step to separate the catalyst. Specifically, the ion exchange resin catalyst does not have cations derived from the lactate salt bound to the resin, and there is also no regeneration of the catalyst required such that a second product that is a basic form of the cation of the lactate salt would not be formed.

Thus, any combination of Powell and Walkup would fail to teach, describe, or suggest the process of independent claims 37 or 40. All other claims ultimately depend upon claim 37, 40, or both, and thus include these same elements.

Since the cited references do not teach or suggest all of the claim limitations they do not set forth even a *prima facie* case of obviousness for this reason alone (see MPEP 706.02(j)). Moreover, the cited references also do not set forth even a *prima facie* case of obviousness for another reason: there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

In this connection, the Examiner has respectfully not met the USPTO's initial burden of pointing to a motivation in the prior art for combining the references. He has respectfully provided only a conditional scenario which respectfully begs the question of why one of skill in the art would have been motivated to combine the references. ("Therefore, **if** the skilled artisan in the art **had desired** to develop the purification of lactic acid involved in the hydrolysis in the presence of CO<sub>2</sub> by using the distillation, it would have been obvious to the skilled artisan in the art **to be motivated** to use Powell's et al cation exchanger in combination with Walkup's et al hydrolysis and distillation in order to increase the efficiency of the overall process." Emphasis supplied.). This is respectfully not sufficient to satisfy the USPTO initial burden to set forth a *prima facie* case of obviousness (see MPEP 706.02(j)).

In fact, in the absence of the hindsight provided by the present specification, it is unclear what benefit, if any, would be provided by the combination of Powell with Walkup, or even how the references would be combined, as the processes used by the references differ significantly. As discussed, Powell uses a cation resin to remove impurities from a lactic acid

stream, while Walkup uses a cation resin as a catalyst for the hydrolysis of lactic acid esters to lactic acid. A modification of either reference would impermissibly change the principle of operation of the reference. See MPEP 2143.01(VI) ("If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.").

In view of the above, Applicants respectfully submit that the cited references cannot set forth even a *prima facie* case of obviousness for the invention as claimed. Accordingly, Applicants respectfully submit that the rejection of all claims should be withdrawn and that the application is now in allowable form. An early notice of allowance is earnestly solicited and is believed to be fully warranted.

Respectfully submitted,

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